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- (56) Prior Art Documents
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- (57) Claim

1. An agricultural composition, said composition comprising a fertilizer and a mineral source which, together, provide a full spectrum of nutrients required for conditioning soil to which said composition is applied and for any plants growing therein, wherein the proportions of said fertilizer and said mineral source are such that the acidity of said composition is essentially neutral.
2. A composition as defined in Claim 1 wherein:

said fertilizer is synthetic; and

said mineral source is stone or rock which is capable of acting as a source of minerals or trace minerals to the soil for use by plant life.
3. A composition as defined in Claim 2 wherein

said fertilizer is a nitrogen-containing fertilizer; and

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said mineral source is selected from one or more of dolomite, bentonite, rock phosphate, rock potash, glacial river gravel, feldspar, dirotite, granite, basalt, limestone or a similarly naturally occurring mineral.

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TITLE: AN AGRICULTURAL COMPOSITION

THIS INVENTION relates to an agricultural composition, its manufacture and method of use. In particular, it is directed to an agricultural composition which is suitable for use as a soil conditioner and fertilizer.

Due to many years of farming, erosion and overgrazing, much of the earth's soil is becoming depleted in minerals. To address this problem, there is an increasing use of the application of soil conditioners and/or fertilizers. Unfortunately, long term use of fertilizers, particularly synthetic fertilizers, has brought its own problems. For example, the acids present in synthetic fertilizers react with the alkaline natural minerals in the soil in order to release the nutrients to the plant. However, this creates a stripping and leaching action in the soil and adds to the depletion of the natural minerals. This stripping and leaching action releases mineral salts into dams, rivers and streams promoting algae growth and salinity. Over time, the ever increasing application rates for synthetic fertilizers and the consequent depletion of the natural minerals have a detrimental affect on soil fertility.

Natural minerals are finding increasing favour as a soil conditioning medium. For best results, it is preferable to apply the mineral as a powder but one problem associated with powdered rock minerals is the difficulty of spreading or otherwise applying the powder in larger farming operations. The powder will not flow through conventional fertilizer spreading equipment and it is difficult to apply as it will not spread uniformly and is easily carried away by the wind during application.

It is an object of the present invention to overcome, or at least ameliorate, one or more of the above disadvantages,

and to provide an agricultural composition, its manufacture and use which can release nutrients effectively to the soil but reduce the degradation of the soil that usually accompanies such release.

5 It has been found that this general objective can be achieved by the application of a particular agricultural composition which is essentially acid neutral.

According to a first aspect of the present invention, there is provided an agricultural composition comprising a
10 fertilizer and a mineral source, wherein the proportions of said fertilizer and said mineral source are such that the acidity of said composition is essentially neutral.

Preferably, said fertilizer is synthetic. More preferably, said fertilizer is a nitrogen-containing fertilizer. Most
15 preferably, said fertilizer is mono-ammonium phosphate.

Preferably, said mineral source is stone or rock which is capable of acting as a source of minerals or trace minerals to the soil for use by plant life. More preferably, said mineral source is selected from one or more of the group
20 comprising dolomite, bentonite, rock phosphate, rock potash, glacial river gravel, feldspar, diorite, granite, basalt, limestone and similarly naturally occurring minerals.

According to a second aspect of the present invention,
25 there is provided a method of producing an agricultural composition, said method comprising:

comminuting a mineral source to a fine powder;

blending said fine powder with a fertilizer;

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adding water to the resultant blended mixture sufficient to initiate an acid neutralization between said mineral source and said fertilizer;

prilling the thus neutralised composition; and

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drying the subsequent prill;

wherein the proportions of said mineral source and said fertilizer are such that the acidity of said composition is essentially acid neutral.

10 In a typical procedure, the mineral source is comminuted to a fine powder in a milling operation using, for example, a hammer mill or ball mill. The powdered mineral source and fertilizer are then blended together in a ribbon blender, chain blender or other mixing apparatus. The blended
15 mixture is then prilled by any conventional means in a rotary tumbler, disc or cone type prilling apparatus or other machinery known to be suitable, and subsequently fed to a drying bed, for example as found in a gas heated rotary tunnel wherein hot dry air circulates around the revolving prill, to evenly dry and set the prill. The
20 product is then stockpiled and allowed to cool before bagging, transportation and use.

Although not essential to the successful working of the present invention, if the mineral source includes dolomite,
25 lime or bentonite, then it is not necessary to add further binding agents or cements to achieve a satisfactory prill.

A preferred embodiment of the present invention will now be described with reference to the following example wherein all percentages are expressed by weight.

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EXAMPLE

A mixture of minerals consisting of granite (28%), basalt (28%), dolomite (7%) and bentonite (7%) were crushed to a fine powder and blended with mono-ammonium phosphate (30%) in a ribbon blender for 5 minutes. The thus blended mixture was moistened and prilled in a rotary tumbler prilling apparatus over a period of two (2) minutes. Preliminary drying and setting of the prill is achieved over 3 to 5 minutes in a gas heated rotary tunnel. It then typically takes approximately four (4) days for the composition to cool sufficiently for bagging and transportation.

With its ability to blend minerals with conventional fertilizers, especially nitrogenous fertilizers, a full spectrum of nutrients necessary for healthy growth can be made available to plant life.

In particular, the pH adjustment also results in activation of the minerals leading to a highly active composition with most crop types responding within two (2) weeks of its application. Further, as the composition is pH neutral, it can be applied direct onto existing pasture, with seed during sowing, or drilled into soil near a root zone without burning root or plant tissue.

It will be appreciated that the above example is given for illustrative purposes only and that modifications and alterations can be made thereto without departing from the inventive concept as defined in the following claims.

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1. An agricultural composition, said composition comprising a fertilizer and a mineral source which, together, provide a full spectrum of nutrients required for conditioning soil to which said composition is applied and for any plants growing therein, wherein the proportions of said fertilizer and said mineral source are such that the acidity of said composition is essentially neutral.
2. A composition as defined in Claim 1 wherein:
- 10 said fertilizer is synthetic; and
- said mineral source is stone or rock which is capable of acting as a source of minerals or trace minerals to the soil for use by plant life.
3. A composition as defined in Claim 2 wherein
- 15 said fertilizer is a nitrogen-containing fertilizer; and
- said mineral source is selected from one or more of dolomite, bentonite, rock phosphate, rock potash, glacial river gravel, feldspar, diorite, granite,
- 20 basalt, limestone or a similarly naturally occurring mineral.

DATED THIS nineteenth DAY OF March 1997.

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ABSTRACT

An essentially acid neutral agricultural composition, its manufacture and use are provided wherein nutrients are released effectively to the soil but the degradation of the soil that usually accompanies such release is reduced.

5 The composition comprises a fertilizer and a mineral source, wherein the proportions of the fertilizer and the mineral source are such that the acidity of the composition is essentially neutral. Preferably, the fertilizer is synthetic and contains nitrogen. Preferably, the mineral

10 source is stone or rock which is capable of acting as a source of minerals or trace minerals to the soil for use by plant life and is selected from one or more of dolomite, bentonite, rock phosphate, rock potash, glacial river gravel, feldspar, diorite, granite, basalt, limestone and

15 similarly naturally occurring minerals. The method of producing the composition comprises comminuting the mineral source to a fine powder, blending the fine powder with the fertilizer, adding water to the resultant blended mixture sufficient to initiate an acid neutralization between the

20 mineral source and the fertilizer, prilling the thus neutralised composition and drying the subsequent prill.